

A MAIN STUDY - TASK DESIGN

A.1 Description of the task

Your city has limited living space; both for citizens and visitors. If a citizen wants to rent out their home on Airbnb to tourists, they need to meet certain requirements. They must also request a license to the municipality. Not everyone adheres to those conditions. The municipality sometimes receives reports that a home has been rented out without meeting the requirements. Until now, a human civil servant would manually investigate the report and find evidence that would help determine whether the reported property was being illegally rented.

Given the shortage of long-term rentals in your city, the municipality has decided to increase its efforts to identify citizens who do not meet the requirements to rent their homes on Airbnb. For this reason the municipality of your city has adopted an Artificial Intelligence system to accelerate the identification of these illegal rentals. With the new system, when a report is filed, the Artificial Intelligence system has access to **[Data provenance]**.

Based on that data, the Artificial Intelligence system **[Model type]** **[Profile]** and it is the first time that this address is reported, a first warning is sent to request the owner to stop renting the property illegally. After this first warning, the owner might face penalties if they fail to adhere to the vacation rental policy.

[We present the diagram of the workflow. We provide an example to illustrate the workflow in practice.]

A few hours ago, a report was filed to complain about a potential case of an illegal holiday rental in 25 Green Hill Street. After retrieving **[Data provenance (...)]**, the evaluation of the Artificial Intelligence is the following:
[Model type] \cap [Data provenance]

Since **[Model type (...)]**, **[Profile (...)]**. The letter includes a first warning and a request to stop renting the property illegally. It also includes information on how to **[Profile (...2)]** to ask any questions the 25 Green Hill Street owner might have.

Table 1: Scenario presented to participants.

Parameters	Conditions	Descriptions
Profile	AI-Human	<i>the human civil servant in charge examines the evaluation of the Artificial Intelligence. If, based on the civil servants' judgement, there are clear signs that indicate an illegal holiday rental in this address, (...) the human civil servant in charge has examined the evaluation of the Artificial Intelligence. Based on the civil servant' judgement, there are indeed clear signs that indicate an illegal holiday rental in this address. The human civil servant has, therefore, send a letter to the property owner of 25 Green Hill Street. (...2) contact the human civil servant in charge,</i>
	Only AI	<i>- (...) the evaluation of the Artificial Intelligence system has led to a letter to be sent to the property owner of 25 Green Hill Street. (...2) interact with the Artificial Intelligence system</i>
Model type	Probabilistic	<i>calculates the probability of a property being illegally rented on the reported address. If the probability is high, (...) the probability of this property being illegally rented is high,</i>
	Rule-based	<i>evaluates through a rule-based system whether the reported address meets the conditions of illegal holiday rental. If relevant conditions are met that indicate an illegal holiday rental in this property, (...) relevant conditions are met that indicate an illegal holiday rental in this property,</i>
Data provenance	Publicly available databases	<i>the public registry, where it retrieves information about prior illegal housing cases, about the building and about the identity and housing rights of the residents. (...) information from the public registry</i>
	Non publicly available data sources	<i>the camera footage of the doorbell in the building. If the doorbell has no camera, then it accesses the footage of the nearest street camera. Thanks to this footage, the AI identifies the flow of people accessing the building. (...) footage from the cameras</i>
Model \cap Data	Probabilistic \cap Public	<p><i>"The property in 25 Green Hill Street has a high probability probability of being an illegal holiday rental. According to the information in the public registry, the following factors determine the high probability:</i></p> <ul style="list-style-type: none"> <i>• Street code +++</i> <i>• Anonymous reporter +++</i> <i>• Number of rooms ++</i> <i>• Date of residence in the address +"</i> <p><i>(+) means that this factors contributed to getting a high probability. The more (+) signs, the bigger the impact of that factor on getting a high probability.</i></p>
	Probabilistic \cap Non-public	<p><i>"The property in 25 Green Hill Street has a high probability probability of being an illegal holiday rental. According to the information obtained from the camera in the last month, the following factors determine the high probability:</i></p> <ul style="list-style-type: none"> <i>• Total number of suitcases detected entering the building +++</i> <i>• Total number of non-regular residents entering the building +++</i> <i>• Flow of people during weekends and holidays ++</i> <i>• Frequency of access of people during working hours +"</i> <p><i>(+) means that this factors contributed to getting a high probability. The more (+) signs, the bigger the impact of that factor on getting a high probability.</i></p>
	Rule-based \cap Public	<p><i>"The property in 25 Green Hill Street meets the conditions for being flagged as an illegal holiday rental. According to the information in the public registry, the following conditions were met:</i></p> <ul style="list-style-type: none"> <i>• The property is located in a highly touristic area of the city</i> <i>• The complaint is not anonymous, it comes from the neighbour nextdoor</i> <i>• The property has more than 2 rooms</i> <i>• The property owner is not registered in this address and has several other properties"</i>
	Rule-based \cap Non-public	<p><i>"The property in 25 Green Hill Street meets the conditions for being flagged as an illegal holiday rental. According to the information obtained from the camera, the following conditions were met in the last month:</i></p> <ul style="list-style-type: none"> <i>• Total number of suitcases detected entering the building > 15</i> <i>• Total number of non-regular residents entering the building > 50</i> <i>• Flow of people during weekends and holidays > 5 people entering the building on average every 30 minutes during the day</i> <i>• Flow of people during working hours > 3 people entering the building on average every hour"</i> <p><i>These conditions apply to this particular building based on its size and factors such as the presence of other Airbnb-s in the building.</i></p>

Table 2: Experimental design.

Your city has limited living space; both for citizens and visitors. If a citizen wants to rent out their home on Airbnb to tourists, they need to meet certain requirements. They must also request a license to the municipality. Not everyone adheres to those conditions. The municipality sometimes receives reports that a home has been rented out without meeting the requirements. Until now, a human civil servant would manually investigate the report and find evidence that would help determine whether the reported property was being illegally rented.

Given the shortage of long-term rentals in your city, the municipality has decided to increase its efforts to identify citizens who do not meet the requirements to rent their homes on Airbnb. For this reason the municipality of your city has adopted an Artificial Intelligence system to accelerate the identification of these illegal rentals. With the new system, when a report is filed, the Artificial Intelligence system has access to the camera footage of the doorbell in the building. If the doorbell has no camera, then it accesses the footage of the nearest street camera. Thanks to this footage, the AI identifies the flow of people accessing the building.

Based on that data, the Artificial Intelligence system calculates the probability of a property being illegally rented on the reported address. If the probability is high, the human civil servant in charge examines the evaluation of the Artificial Intelligence. If, based on the civil servants' judgement, there are clear signs that indicate an illegal holiday rental in this address, and it is the first time that this address is reported, a first warning is sent to request the owner to stop renting the property illegally. After this first warning, the owner might face penalties if they fail to adhere to the vacation rental policy.

Figure 1: Screenshot of one of the presented scenarios (Profile = Hybrid, Model Type = Probabilistic, Data = Camera).

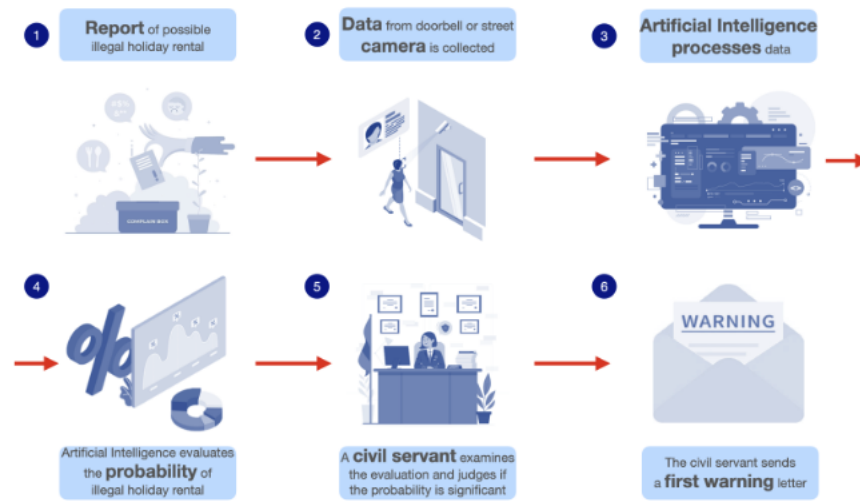


Figure 2: Screenshot of the visual stimulus (Profile = Hybrid, Model Type = Probabilistic, Data = Camera).

A few hours ago, a report was filed to complain about a potential case of an illegal holiday rental in 25 Green Hill Street. After retrieving footage from the cameras, the evaluation of the Artificial Intelligence is the following:

"The property in 25 Green Hill Street has a high probability of being an illegal holiday rental. According to the information obtained from the camera in the last month, the following factors determine the high probability:

- Total number of suitcases detected entering the building
+++
- Total number of non-regular residents entering the building
+++
- Flow of people during weekends and holidays ++
- Frequency of access of people during working hours +

(+) means that this factor contributed to getting a high probability. The more (+) signs, the bigger the impact of that factor on getting a high probability."

Since the probability of this property being illegally rented is high, the human civil servant in charge has examined the evaluation of the Artificial Intelligence. Based on the civil servants' judgement, there are clear signs that indicate an illegal holiday rental in this address. The human civil servant has, therefore, sent a letter to the property owner of 25 Green Hill Street. The letter includes a first warning and a request to stop renting the property illegally. It also includes information on how to contact the human civil servant in charge to ask any questions the owner might have.

Figure 3: Screenshot of the example of the workflow in practice (Profile = Hybrid, Model Type = Probabilistic, Data = Camera).

A.2 Measurements

A. Items to measure *perceived ability*. Assessed on a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) [Decision-maker]¹ has the competence to include all necessary information for making decisions about illegal holiday rentals.
- (2) [Decision-maker] is able to process all data necessary for making decisions about illegal holiday rentals.
- (3) [Decision-maker] is able to consider all necessary data when making decisions about illegal holiday rentals.
- (4) [Decision-maker] is capable of flexibly considering different circumstances when making decisions about illegal holiday rentals.
- (5) [Decision-maker] has the competence to adapt its decision to different circumstances.
- (6) [Decision-maker] is able to react flexibly to circumstances in the decision-making process.

B. Items to measure *perceived benevolence*. Assessed on a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) [Decision-maker] will take care of the welfare of the owner of 25 Green Hill Street.
- (2) [Decision-maker] will consider the needs and desires of the owner of 25 Green Hill Street.
- (3) [Decision-maker] will act on the best interest if the owner of 25 Green Hill Street.
- (4) [Decision-maker] will look out what is important for the owner of 25 Green Hill Street.
- (5) [Decision-maker] will go out of its way to help the owner of 25 Green Hill Street.

C. Items to measure *perceived integrity*. Assessed on a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) [Decision-maker] acts with a strong sense of justice.
- (2) [Decision-maker] acts in an honest way.
- (3) [Decision-maker] is fair when identifying illegal holiday rentals.
- (4) The behaviours and decisions coming out of [Decision-maker] are not very consistent (r).
- (5) I like the values and purposes behind having a [Decision-maker] for identifying illegal holiday rentals.
- (6) Sound principles guide the behaviour of [Decision-maker].

D. Item to measure *perceived fairness*. Assessed on a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) Overall the decision-making process for identifying illegal holiday rentals set up by the municipality is fair.

A.2.1 *Descriptive and control variables*. A. Questionnaire for determining *age range*.

What is your age range?

- A1: 0-18
- A2: 19-25
- A3: 26-35
- A4: 36-50
- A5: 50-80
- A6: 80+

B. Questionnaire for determining *level of education*.

What is the highest level of school that you have completed or the highest degree you have received?

- A1: High school incomplete or less.
- A2: High school graduate or GED (includes technical / vocational training that does not award college credit)
- A3: Some college (some community college, associate's degree).
- A4: Four year college degree / bachelor's degree
- A5: Some postgraduate or professional schooling, no postgraduate degree
- A6: Postgraduate or professional degree, including master's, doctorate, medical or law degree

C. Items to determine experience as *lessee of short-term rentals*. Assessed as a yes/no question.

- (1) I have rented my house out for short-term rentals (for example, Airbnb) and I had a license for it.
- (2) I have rented my house out for short-term rentals and I did not have a license for it.

D. Items to measure *AI literacy*. Assessed on a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) I have a good knowledge in the field of *artificial intelligence*.

¹[Decision-maker] is either "The Artificial Intelligence system" or "The human civil servant (by) using the Artificial Intelligence system and their own judgment" depending on the condition that each participant gets.

- (2) My current employment includes working with *artificial intelligence*.
- (3) I am confident interacting with *artificial intelligence*.
- (4) I understand what the term *artificial intelligence* means.

E. Items to measure *affinity to technology*. Assessed on a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) I like to occupy myself in greater details with technical systems (systems that include some technology: computing systems, electronic gadgets, mechanisms)
- (2) I like testing functions of new technical systems.
- (3) It is enough for me that a technical system works; I don't care about how or why (r)².
- (4) It is enough for me to know the basic functions of a technical system (r).

F. Items to measure *personal experience with short-term rentals*. Assessed in a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) I am aware of human civil servants identifying illegal holiday rentals.
- (2) I am aware of artificial intelligence systems detecting illegal holiday rentals.

G. Items to measure *personal experience with public administration*. Assessed in a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) I have a good experience dealing with the human civil servants in the public administration.

H. Item to measure *affinity to short-term rental policy*. Assessed in a seven-point Likert scale (1 = completely disagree, 7 = completely agree).

- (1) It is acceptable that the municipality enforces a policy to identify and penalize short-term rentals like Airbnb(s) that are not officially registered.

I. Item to measure *perceived task complexity*. Assessed in a seven-point Likert scale (1 = very low in complexity, 7 = very high in complexity).

- (1) How complex do you think it is to identify illegal holiday rentals?

J. Open-ended questions.

- (1) Do you think [**Decision-maker**] is capable of correctly identifying illegal holiday rentals? Why?
- (2) Do you think the [**Decision-maker**] will try to help the 25 Green Hill Street owner? Why?
- (3) Do you think it is right that the municipality relies on [**Decision-maker**] for the decision-making process? Why?

A.2.2 Screenshots of the measurements in the Main Study.

²Reverse coded

Main Study

Remind me the workflow

Remind me the example

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
The human civil servant by using the Artificial Intelligence system and their own judgement has the competence to include all necessary information for making decisions about illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The human civil servant by using the Artificial Intelligence system and their own judgement is able to process all data necessary for making decisions about illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The human civil servant by using the Artificial Intelligence system and their own judgement is able to consider all necessary data when making decisions about illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The human civil servant by using the Artificial Intelligence system and their own judgement is capable of flexibly considering different circumstances when making decisions about illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 4: Screenshot from the Main Study, where participants would rate their perceptions of ability towards the decision-maker (part 1).

The human civil servant by using the Artificial Intelligence system and their own judgement has the competence to adapt its decision to different circumstances

The human civil servant by using the Artificial Intelligence system and their own judgement is able to react flexibly to circumstances in the decision-making process

This figure shows a screenshot of a questionnaire interface. It contains two statements, each followed by a horizontal row of seven empty circles for rating. The first statement is: 'The human civil servant by using the Artificial Intelligence system and their own judgement has the competence to adapt its decision to different circumstances'. The second statement is: 'The human civil servant by using the Artificial Intelligence system and their own judgement is able to react flexibly to circumstances in the decision-making process'.

Figure 5: Screenshot from the Main Study, where participants would rate their perceptions of ability towards the decision-maker (part 2).

Do you think the human civil servant by using an Artificial Intelligence system and their own judgement is capable of correctly identifying illegal holiday rentals? Why?

This figure shows a screenshot of a text input field. Above the input box is the question: 'Do you think the human civil servant by using an Artificial Intelligence system and their own judgement is capable of correctly identifying illegal holiday rentals? Why?'. The input box itself is a simple rectangular text area.

Figure 6: Screenshot from the Main Study, where participants expand on their rationales for perceived ability towards the decision-maker.

Main Study



Figure 7: Screenshot from the Main Study, where participants would rate their perceptions of benevolence towards the decision-maker.

Do you think the human civil servant by using an Artificial Intelligence system and their own judgement will try to help the 25 Green Hill Street owner? Why?

A screenshot of a survey question. The question is: "Do you think the human civil servant by using an Artificial Intelligence system and their own judgement will try to help the 25 Green Hill Street owner? Why?". Below the question is a single-line text input field with a light gray background and a thin black border.

Figure 8: Screenshot from the Main Study, where participants expand on their rationales for perceived benevolence towards the decision-maker.

Main Study

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
The human civil servant by using the Artificial Intelligence system and their own judgement acts with a strong sense of justice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The human civil servant by using the Artificial Intelligence system and their own judgement acts in an honest way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The human civil servant by using the Artificial Intelligence system and their own judgement is fair when identifying illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Behaviours and decisions coming out of the human civil servant using the Artificial Intelligence system and their own judgement are not very consistent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like the values and purposes behind having the human civil servant using the Artificial Intelligence system and their own judgement for identifying illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sound principles guide the behaviour of the human civil servant using the Artificial Intelligence system and their own judgement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 9: Screenshot from the Main Study, where participants would rate their perceptions of integrity towards the decision-maker.

Do you think it is right that the municipality relies on the human civil servant using an Artificial Intelligence system and their own judgement for the decision-making process? Why?

Figure 10: Screenshot from the Main Study, where participants expand on their rationales for perceived integrity towards the decision-maker.

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
Overall the decision-making process for identifying illegal holiday rentals set up by the municipality is fair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 11: Screenshot from the Main Study, where participants would rate their perceptions of fairness.

What is your age range?

<input type="radio"/> 0-18
<input type="radio"/> 19-25
<input type="radio"/> 26-35
<input type="radio"/> 36-50
<input type="radio"/> 50-80
<input type="radio"/> 80+

Figure 12: Screenshot from the Main Study, where participants would determine their age range.

What is the highest level of school you have completed or the highest degree you have received?

- ☐ High school incomplete or less
- ☐ High school graduate or GED (includes technical / vocational training that does not award college credit)
- ☐ Some college (some community college, associate's degree)
- ☐ Four year college degree / bachelor's degree
- ☐ Some postgraduate or professional schooling, no postgraduate degree
- ☐ Postgraduate or professional degree, including master's, doctorate, medical or law degree

Figure 13: Screenshot from the Main Study, where participants would select their level of education.

Respond yes or no to the following 2 statements

	No	Yes
I have rented my house out for short-term rentals (for example, Airbnb) and I had a license for it	<input type="radio"/>	<input type="radio"/>
I have rented my house out for short-term rentals and I did not have a license for it	<input type="radio"/>	<input type="radio"/>

Figure 14: Screenshot from the Main Study, where participants would select whether they have any experience renting out their property as a short-term rental.

Indicate how much you agree or disagree with the following 4 statements.

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
I think I have a good knowledge in the field of artificial intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My current employment includes working with artificial intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident interacting with artificial intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understand what the term artificial intelligence means	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 15: Screenshot from the Main Study, where participants would self-rate their AI literacy.

Indicate how much you agree or disagree with the following 4 statements.

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
I like to occupy myself in greater detail with technical systems (systems that include some technology: computing systems, electronic gadgets, mechanisms)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like testing functions of new technical systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is enough for me that a technical system works; I don't care about how or why	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is enough for me to know the basic functions of a technical system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 16: Screenshot from the Main Study, where participants would rate their affinity to technology.

Indicate how much you agree or disagree with the following 2 statements.

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Slightly agree	Completely agree
I am aware of human civil servants identifying illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am aware of artificial intelligence systems detecting illegal holiday rentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 17: Screenshot from the Main Study, where participants would rate their experience with humans and algorithms detecting illegal short-term rental.

Indicate how much you agree or disagree with the following statement.

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
I have a good experience dealing with human civil servants in the public administration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 18: Screenshot from the Main Study, where participants would rate their experience with humans in the public administration.

Indicate how acceptable you find the following policy

	Completely disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Completely agree
It is acceptable that the municipality enforces a policy to identify and penalize short-term rentals like Airbnb(s) that are not officially registered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 19: Screenshot from the Main Study, where participants would rate their agreement with the enforced policy.

Please answer to the following question

	Very low in complexity	Low in complexity	Slightly low in complexity	Neither low nor high in complexity	Slightly high in complexity	High in complexity	Very high in complexity
How complex do you think it is to identify illegal holiday rentals (illegal Airbnb for example)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 20: Screenshot from the Main Study, where participants would rate the perceived complexity of the use case.